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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,488	08/22/2003	Chih-Chung Chen	BHT-3111-354	8710

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EXAMINER	
CONNELLY CUSHWA, MICHELLE R	
ART UNIT	**PAPER NUMBER**
2874	

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/645,488	CHEN ET AL.	
	Examiner	Art Unit	
	Michelle R. Connelly-Cushwa	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-11 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-11 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 22 August 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It was not executed in accordance with either 37 CFR 1.66 or 1.68.

The declaration was not dated by the second listed inventor.

Drawings

Sixteen (16) sheets of formal drawings were filed on August 22, 2003 and have been accepted by the Examiner.

Specification

The abstract of the disclosure is objected to because the abstract exceeds 150 words. Correction is required. See MPEP § 608.01(b).

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Morimoto et al. (US 2002/0097977 A1).

Regarding claim 1; Morimoto et al. discloses an optical signal processing apparatus based on a movable tilted reflection mirror, which includes:

- an optical input element (5);
- an optical output element (7); and
- a MEMS movable tilted reflection mirror unit (25), comprising at least a reflective mirror plane (27, 29) and a micro actuator (24R) connected therewith;
- wherein the optical input element (5), the output element (7) and the MEMS mirror unit (5) are arranged to form an optical transmission path where incident light signals from the optical input element are reflected from the reflective mirror plane toward the optical output element to form an output light, and a reflected light is formed between the reflective mirror plane and the optical output element;

- wherein the intensity of the reflected output light is determined by the percentage of intensity of the reflected light coupled into the optical output element; and
- wherein the intensity of the reflected light is controlled by the position of the reflective mirror plane that is adjustable according to a value of applied electrical load on the micro actuator (see Figures 1-3 and 13, and the corresponding written description).

Regarding claim 2; the reflective mirror plane comprises a highly reflective thin film formed on a surface thereof (see paragraph [0025]).

Regarding claim 3; the input and output elements (5 and 7) are optical fibers.

Regarding claim 4; the reflective mirror plane is a flat mirror plane (see Figures 1-3 and 13, and paragraph [0062]).

Regarding claim 5; the apparatus further comprises a control unit (control means; see claim 1 of the reference) to provide the functions of variable optical attenuation and optical switching and the control unit can be used in applications for a communication network.

Regarding claim 6; the moving directions of the reflective mirror plane actuated by the micro actuator are arbitrary directions according to the layout of the optical input element (5), the optical output element (7) and the MEMS movable tilted reflection mirror unit (25).

Regarding claim 7; the micro actuator is an electrostatic MEMS actuator (see paragraph [0063]).

Regarding claim 8; optical elements (21, 23) are arranged on the optical transmission path to reduce unwanted coupling loss between different elements in the optical transmission path.

Claims 1, 3, 4, 6, 7 and 9-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Chang et al. (US 2003/0012509 A1).

Regarding claim 1; Chang et al. discloses an optical signal processing apparatus based on a movable tilted reflection mirror in Figures 5-12 (see the abstract), which includes:

- an optical input element (input waveguides; 44, 64 or 70);
- an optical output element (output waveguides; 46, 66, 68, 74 or 78); and
- a MEMS movable tilted reflection mirror unit (72), comprising at least a reflective mirror plane and a micro actuator (see the abstract) connected therewith;
- wherein the optical input element, the output element and the MEMS mirror unit are arranged to form an optical transmission path where incident light signals from the optical input element are reflected from the reflective mirror plane toward the optical output element to form an output light, and a reflected light is formed between the reflective mirror plane and the optical output element;

- wherein the intensity of the reflected output light is determined by the percentage of intensity of the reflected light coupled into the optical output element; and
- wherein the intensity of the reflected light is controlled by the position of the reflective mirror plane that is adjustable according to a value of applied electrical load on the micro actuator.

Regarding claim 3; the input and output elements are optical waveguides.

Regarding claim 4; the reflective mirror plane is a flat mirror plane.

Regarding claim 6; the moving directions of the reflective mirror plane actuated by the micro actuator are arbitrary directions according to the layout of the optical input element, the optical output element and the MEMS movable tilted reflection mirror unit.

Regarding claim 7; the micro actuator is an electrostatic MEMS actuator.

Regarding claim 9; the apparatus is arranged in an array layout for multiple channel application of the variable optical attenuator and optical switch (see Figure 24).

Regarding claim 10; a plurality of the apparatus are integrated to form an optical signal processing apparatus with the multiple channel processing function (see Figures 24, 27 and 28).

Regarding claim 11; a plurality of the apparatus are integrated to from an optical process apparatus with the functions of variable optical attenuation, optical switching, optical multiplexing/demultiplexing, and optical add/drop,

wherein the reflective mirror plane is controlled by the micro actuator individually for each MEMS movable tilted reflection mirror unit of each channel of the multiple channels inside the optical signal processing apparatus (see Figure 28).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Kompfner (US 4,337,993); Lance et al. (US 4,516,827); Colbourne et al. (US 5,915,063) ; Diemeer (US 6,285,504 B1) ; Liu et al. (US 6,526,673 B1); Vaganov (US 6,590,697 B2); Hoover et al. (US 2002/0015572 A1); Fuchs et al. (US 2002/0076191 A1); Gelbart (US 2002/0150377 A1); Heffner et al. (US2002/0150378 A1); IN'T Hout et al. (US 2003/0026582 A1); Vaganov et al. (US 2003/0049009 A1); Janssen (US 2003/0095777 A1); Chu et al. (US 2004/0008967 A1); and Polinsky et al. (US 2004/0114246 A1) each disclose optical devices having an input optical waveguide, an output optical waveguide, and a MEMS movable tilted mirror for optical coupling, switching and/or attenuation.

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

Michelle R. Connelly-Cushwa
Patent Examiner
March 3, 2005